flowing a plasma source material into the plasma reactor, the plasma source material including HCl;

generating a plasma from the plasma source material; and

exposing the work piece to the plasma to etch the at least one magnetic material layer.

12. The method of claim 11 wherein the work piece comprises an electron barrier material layer having aluminum oxide.

13. The method of claim 12 wherein the step of exposing the work piece to the plasma is to etch the electron barrier material layer.

14. The method of claim 11 wherein the work piece comprises an anti-magnetic material layer selected from PtMn and IrMn.

15. The method of claim 14 wherein the step of exposing the work piece to the plasma etches the anti-magnetic material layer.

16. (Cancelled) For a process chamber configured to allow an operator thereof to select a gaseous mixture for etching a portion of a magnetic memory cell stack, the portion of the magnetic memory cell stack having two magnetic orientation material layers separated by a tunnel barrier layer and having an anti-magnetic material layer, the gaseous mixture comprising:

HCl as a main etchant gas to etch the portion of the magnetic memory cell stack.

17. (Cancelled) The mixture of claim 16 wherein the two magnetic orientation material layers comprise at least one of NiFe, CoFe, NiFeCo, and Ru.

18. (Cancelled) The mixture of claim 17 wherein the tunnel barrier layer comprises an aluminum oxide.

19. (Cancelled) The mixture of claim 18 wherein the anti-magnetic material layer comprises at least one of PtMn and IrMn.

20. (Cancelled) The mixture of claim 17 wherein the gaseous mixture further comprises at least one of HBr, Cl_2, BCl_3, Ar, N_2 and O_2.

26. A method for plasma etching in a plasma reactor, comprising:

positioning a work piece in the plasma reactor, the work piece including an anti-magnetic material layer selected from PtMn and IrMn;

flowing a plasma source material into the plasma reactor, the plasma source material including HCl;

generating a plasma from the plasma source material; and

exposing the work piece to the plasma to etch the anti-magnetic material layer.

27. The method of claim 26 wherein the work piece comprises an electron barrier material layer having aluminum oxide.

28. The method of claim 27 wherein the step of exposing the work piece to the plasma is to etch the electron barrier material layer.

29. The method of claim 26 wherein the work piece comprises at least one magnetic material layer selected from NiFe, CoFe, NiFeCo, and Ru.

30. The method of claim 29 wherein the step of exposing the work piece to the plasma etches the at least one magnetic material layer.

31. A method for processing a substrate in a plasma reactor, comprising:

introducing a plasma source material including HCl into the plasma reactor;

generating a plasma from the plasma source material; and

exposing the substrate to the plasma to etch a set of layers formed on the substrate, the set of layers having an anti-magnetic material layer and at least two magnetic material layers separated by an electron barrier layer.

32. The method of claim 31, wherein introducing the plasma source material comprises flowing the HCl at a rate equal to or greater than any other etchant gases for etching the set of layers.

33. The method of claim 31, wherein the other etchant gases comprise at least one of HBr, Cl_2, BCl_3, Ar, N_2 or O_2.

34. The method of claim 31, wherein the set of layers comprises at least one of Ni, Fe, Co, Ru or any combination thereof.

35. The method of claim 31, wherein the set of layers comprises at least one of Pt, Ir, Mn or any combination thereof.

36. The method of claim 31, wherein the electron barrier material layer comprises aluminum oxide.

37. The method of claim 31, wherein the anti-magnetic material layer is made from PtMn or IrMn.

38. The method of claim 31, wherein the at least two magnetic material layers are made from NiFe, CoFe, NiFeCo, or Ru.

39. The method of claim 31, wherein exposing the substrate to the plasma to etch the set of layers comprises etching through openings defined in at least one masking layer formed over the set of layers.

40. The method of claim 39, wherein the at least one masking layer comprises a layer of a resist and a layer of an amorphous carbon is formed over the set of layers.

41. The method of claim 39, wherein the at least one masking layer comprises a layer of a resist and a layer of a hydro-carbon polymer resin is formed over the set of layers.

42. The method of claim 31, further comprising, after exposing the substrate to the plasma, exposing the substrate to a second plasma formed from a second plasma source material including a hydrogen and fluorine gas.

43. The method of claim 42, wherein the substrate is exposed to the second plasma in a second plasma reactor.

44. The method of claim 42, wherein the hydrogen and fluorine gas is selected from CHF3, CH2F2, or CH3F.

45. The method of claim 31, wherein the anti-magnetic material layer is made from PtMn or IrMn and the at least two magnetic material layers are made from NiFe, CoFe, NiFeCo, or Ru.

REMARKS

This is intended as a full and complete response to the Restriction Requirement dated January 24, 2003, having a shortened statutory period for response set to expire on February 24, 2003. Claims 11-20 and 26-45 are pending in the application and are subject to an election/restriction requirement. Claims 16-20 have been cancelled without prejudice. Applicants reserve the right to subsequently take up prosecution of the claims as originally filed in this application or in a continuation, a continuation-in-part and/or a divisional application. Please reconsider the claims pending in the application for reasons discussed below.